

CLAIMS

1. A transformer for producing high electrical currents used for transforming high alternating currents and power pulse currents for production of magnetic fields for magnetizing magnets and magnet systems and in conversion technology for formation of electrically conductive materials by means of a magnetic field, comprising:

at least one primary coil and at least one secondary part, wherein said at least one primary coil and at least one secondary part are connected with bus bars, wherein the secondary part of the transformer comprises at least one electrically conductive plate, wherein at least one cut-out penetrates the plate, wherein at least one slit originating from the cut-out is provided, wherein the at least one slit separates the plate on one side of each cut-out into two parts and produces the necessary bus bars, and wherein in rings about each cut-out, a primary coil with its bus bars can be electrically insulated in the plate.

2. The transformer according to claim 1, wherein the cut-out on the plate is surrounded by an annular ring that receives the primary coil, wherein the primary coil is inserted into the annular groove and encapsulated with insulating material.

3. The transformer according to claim 1, wherein the plate has a separating wall encircling the cut-out and projecting over the primary coil on an inner circumference.

4. The transformer according to claim 1, wherein the annular groove has a substantially U-shaped cross section and opens toward a flat side of the plate.

5. The transformer according to claim 1, wherein the cut-out on the plate has a round or polygonal cross section.

6. The transformer according to claim 1, wherein the primary coil is formed flat and disk-shaped with multiple windings encircling radially outward.

7. The transformer according to claim 6, wherein the windings of the primary coil are coiled in two parallel planes with a winding gap between the two planes, such that the winding gap lies on an inner circumference from one of the two planes to the other and the two bus bars lie on an outer circumference of the primary coil.

8. The transformer according to claim 1, wherein two or more primary coils are countersunk in a stack on one another in the plate.

9. The transformer according to claim 1, wherein the primary coil comprises an insulating conductor with a round, square, or tube-shaped cross section or electrically conductive conductors connected to one another and insulated from one another with a central opening surrounding the cut-out of the plate in a ring.

10. The transformer according to claim 9, wherein the primary coil comprises multiple disks arranged in a stack and fixedly wire-braced with one another with a central opening, and wherein each disk has a radial slit originating from the central opening with electrical terminals arranged on two sides, a ring-shaped inner region for guiding current and an outer region for conducting heat with broad radial slits, and wherein the individual disks are spirally connected with one another in a series.

11. The transformer according to claim 1, wherein the plate comprises a material with a high electrical conductivity, wherein the material is selected from the group consisting of copper, aluminum, or alloys of copper and aluminum with chromium and/or zirconium, for example, Cu Cr Zr- alloys.

12. The transformer according to claim 1, wherein at least one consumer, such as a coil, is connected to the transformer with an electrical cable.

13. The transformer according to claim 1, wherein at least one consumer, such as a magnetic field former, is connected mechanically fixedly with the transformer.

14. The transformer according to claim 1, wherein the plate and at least one consumer form a closed, physical component.

15. The transformer according to claim 1, wherein in the plate, multiple cut-outs or bores are provided with associated annular grooves, primary coils, and slits, as well as multiple primary and secondary bus bars corresponding to the number of the cut-outs or bores.

16. The transformer according to claim 1, wherein multiple, identically formed plates are combined with overlapping cut-outs or bores, annular grooves, primary coils, and slits in a stack to form a transformer block with associated primary and secondary bus bars.

17. The transformer according to claim 16, wherein the plates have multiple coaxially directed bores for clamping bolts, which penetrate and hold together the plate stack.

18. The transformer according to claim 1, wherein the primary coils are cooled by a liquid or gaseous medium, wherein the medium is selected from the group consisting of air, water, oil, or nitrogen.